Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A lithographic projection apparatus, comprising:

a support structure configured to hold a patterning device, the patterning device configured to pattern a beam of radiation;

a substrate table configured to hold a substrate;

an actuator configured to move ~~at least one of~~ the support structure, ~~and~~ the substrate table, or both;

a controller configured to provide a motion signal to the actuator, the motion signal controlling the actuator to produce a motion of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both, an absolute value of ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the position of the motion being limited to less than a maximal finite value; and

a projection system configured to project the patterned beam onto a target portion of the substrate.

2. (Currently Amended) The apparatus of claim 1, wherein the motion signal comprises a motion signal for a desired position of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both.

3. (Original) The apparatus of claim 2, comprising a trajectory planner configured to generate the motion signal by constructing a function of time that is to serve as the n^{th} derivative to time of the motion signal and integrating the constructed function n times, where $n \geq 4$.

4. (Original) The apparatus of claim 3, wherein constructing the function of time comprises defining consecutive time intervals with a substantially constant function value.

5. (Original) The apparatus of claim 4, wherein the substantially constant function value in each consecutive time interval is either a maximal positive value, a maximal negative value of the substantially same absolute value as the maximal positive value, or zero.

6. (Original) The apparatus of claim 3, wherein intermediate results of integrating the constructed function of time are determined, including a jerk profile, an acceleration profile, a velocity profile, and a position profile, the position profile corresponding to the motion signal, as respective integrals of the constructed function of time.

7. (Currently Amended) The apparatus of claim 6, wherein an absolute value of ~~at least one of~~ (i) the jerk profile, (ii) the acceleration profile, (iii) the velocity profile, ~~and~~ (iv) the position profile, or (v) any combination of (i)-(iv) is limited to less than a maximal finite value.

8. (Currently Amended) The apparatus of claim 1, wherein the maximal value in advance of ~~at least one of~~ a substantially constant velocity phase, ~~and~~ a stopping point, or both, of the motion is less than the maximal value of another part of the motion.

9. (Currently Amended) The apparatus of claim 8, wherein the maximal value in advance of ~~the at least one of~~ the substantially constant velocity phase, ~~and~~ the stopping point, or both, is less than or equal to 25% of the maximum value of another part of the motion.

10. (Original) The apparatus of claim 8, wherein the maximal value in advance of the stopping point is less than or equal to 50% of the maximal value of another part of the motion and a maximal value of the jerk of the motion in advance of the stopping point is less than or equal to 50% of the maximal value of the jerk of another part of the motion.

11. (Currently Amended) The apparatus of claim 1, wherein the motion of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both, is in a scanning direction.

12. (Original) The apparatus of claim 1, wherein the motion of the substrate table is in a stepping direction.

13. (Original) The apparatus of claim 1, wherein the motion of the substrate table is in a stepping direction and in a scanning direction.

14. (Original) The apparatus of claim 1, wherein the maximal value for a negative acceleration phase in the motion equals the maximal value of a positive acceleration phase in the motion.

15. (Original) The apparatus of claim 1, wherein the maximal value for a negative acceleration in the motion is greater than or equal to 10 and less than or equal to 20 times the maximal value of a positive acceleration for starting the motion.

16. (Currently Amended) The apparatus of claim 1, wherein the motion signal is determined using a feed-forward comprising ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the position of the motion limited to less than a maximal finite value.

17. (Currently Amended) A lithographic apparatus, comprising:

a support structure configured to hold a patterning device, the patterning device configured to pattern a beam of radiation;

a substrate table configured to hold a substrate;

an actuator configured to move a part of the lithographic apparatus in at least one degree of freedom in accordance with a set-point signal for a desired position of the part, ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the set-point signal being limited to a boundary; and

a projection system configured to project the patterned beam onto a target portion of the substrate.

18. (Currently Amended) A computer program product to control motion of ~~at least one of~~ a substrate table, ~~and~~ a patterning device support structure, or both, in a lithographic apparatus, comprising software code configured to generate motion data used to control an actuator to produce a motion of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both, an absolute value of ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both,

derivative to time of the position of the motion being limited to less than a maximal finite value.

19. (Currently Amended) The computer program product of claim 18, comprising software code configured to provide a motion signal for an actuator, said motion signal corresponding to a desired position of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both.

20. (Currently Amended) The computer program product of claim 18, wherein the maximal value in advance of ~~at least one of~~ a substantially constant velocity phase, ~~and~~ a stopping point, or both, of the motion is less than the maximal value of another part of the motion.

21. (Currently Amended) The computer program product of claim 18, wherein the motion of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both, is in a scanning direction of the lithographic apparatus.

22. (Original) The computer program product of claim 18, wherein the motion of the substrate table is in a stepping direction of the lithographic apparatus.

23. (Original) The computer program product of claim 18, wherein the motion of the substrate table is in a stepping direction and in a scanning direction of the lithographic apparatus.

24. (Currently Amended) The computer program product of claim 18, wherein the motion signal is determined using a feed-forward comprising ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the position of the motion limited to less than a maximal finite value.

25. (Currently Amended) A device manufacturing method comprising:

actuating ~~at least one of~~ a mask table, ~~and~~ a substrate table, or both, of a lithographic apparatus in at least one degree of freedom using a set-point signal for the desired position of ~~the at least one of~~ the mask table, ~~and~~ the substrate table, or both, ~~at least one of~~ a fourth, ~~and~~

a higher than fourth, or both, derivative to time of the set-point signal being limited to a finite maximum; and

projecting a patterned beam of radiation onto a target portion of a substrate held by the substrate table.

26. (Original) The method of claim 25, wherein the degree of freedom includes a scanning direction of the lithographic apparatus.

27. (Original) The method of claim 25, wherein the degree of freedom includes a stepping direction of the lithographic apparatus.

28. (Currently Amended) The method of claim 25, comprising reducing the maximal value in advance of ~~at least one of~~ a substantially constant velocity phase, ~~and~~ a stopping point, or both, of the motion to less than the maximal value of another part of the motion.

29. (Currently Amended) The method of claim 25, wherein the set-point signal is determined using a feed-forward comprising ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the set-point signal limited to a finite maximum.

30. (Currently Amended) A lithographic projection apparatus, comprising:

a support structure configured to hold a patterning device, the patterning device configured to pattern a beam of radiation;

a substrate table configured to hold a substrate;

an actuator connected to ~~at least one of~~ the support structure, ~~and~~ the substrate table, or both;

a controller configured to provide a motion signal to the actuator, the motion signal controlling the actuator to produce an acceleration of ~~at least one of~~ the support structure, ~~and~~ the substrate table, or both, having a high ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at a start portion of the acceleration and a corresponding low ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at an end portion of the acceleration, the absolute value of the high ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the corresponding low ~~at least~~

~~one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion; and

a projection system configured to project the patterned beam onto a target portion of the substrate.

31. (Currently Amended) The apparatus of claim 30, wherein the absolute value of the third derivative to time of the position of the motion is less than a maximal finite value.

32. (Currently Amended) The apparatus of claim 30, wherein the absolute value of ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the position of the motion is less than a maximal finite value.

33. (Currently Amended) The apparatus of claim 30, wherein the motion signal controls the actuator to produce acceleration having a corresponding substantially zero ~~at least one of~~ a third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion for an intermediate period between the start portion and the end portion.

34. (Currently Amended) The apparatus of claim 30, wherein the acceleration is a positive acceleration and the controller is further configured to provide a motion signal to the actuator, the motion signal controlling the actuator to produce a negative acceleration of ~~the at least one of~~ the support structure, ~~and~~ the substrate table, or both, having a high negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion, the absolute value of the high negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the corresponding low ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion.

35. (Currently Amended) The apparatus of claim 34, wherein the negative acceleration comprises the high negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion for a start period and the high negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion for an end period.

36. (Currently Amended) The apparatus of claim 35, wherein the negative acceleration comprises a corresponding substantially zero ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion for an intermediate period between the start period and the end period.

37. (Currently Amended) The apparatus of claim 30, wherein the acceleration is a positive acceleration and the controller is further configured to provide a motion signal to the actuator, the motion signal controlling the actuator to produce a negative acceleration of the ~~at least one of the~~ support structure, ~~and~~ the substrate table, or both, having a low negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at a start period of the negative acceleration and a corresponding high negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion, the absolute value of the corresponding high negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the low negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion.

38. (Original) The apparatus of claim 30, wherein the acceleration comprises a positive acceleration phase and negative acceleration phase.

39. (Original) The apparatus of claim 30, wherein the acceleration comprises a scanning direction.

40. (Original) The apparatus of claim 30, wherein the acceleration comprises a stepping direction.

41. (Original) The apparatus of claim 40, wherein the acceleration further comprises a scanning direction.

42. (Original) The apparatus of claim 30, wherein the motion signal comprises a position signal.

43. (Currently Amended) A computer program product to control motion of ~~at least one of~~ a patterning device support structure, ~~and~~ a substrate table, or both, in a lithographic apparatus, comprising software code configured to generate motion data used to control an actuator to produce an acceleration of ~~the at least one of~~ the patterning device support structure, ~~and~~ the substrate table, or both, having a high ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at a start portion of the acceleration and a corresponding low ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at an end portion of the acceleration, the absolute value of the high ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the corresponding low ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion.

44. (Currently Amended) The computer program product of claim 43, wherein the absolute value of the third derivative to time of the position of the motion is less than a maximal finite value.

45. (Currently Amended) The computer program product of claim 43, wherein the absolute value of ~~at least one of~~ a fourth, ~~and~~ a higher than fourth, or both, derivative to time of the position of the motion is less than a maximal finite value.

46. (Currently Amended) The computer program product of claim 43, comprising software code configured to produce motion data used to control an actuator to produce an acceleration having a corresponding substantially zero ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion for an intermediate period between the start portion and the end portion.

47. (Currently Amended) The computer program product of claim 43, wherein the acceleration is a positive acceleration and comprising software code configured to produce motion data used to control an actuator to produce a negative acceleration of ~~the at least one of~~ the patterning device support structure, ~~and~~ the substrate table, or both, having a high negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion, the absolute value of the high negative acceleration ~~at least one~~

~~of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the corresponding low ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion.

48. (Currently Amended) The computer program product of claim 43, wherein the acceleration is a positive acceleration and comprising software code configured to produce motion data used to control an actuator to produce a negative acceleration of ~~the at least one of~~ the patterning device support structure, ~~and~~ the substrate table, or both, having a low negative acceleration ~~at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at a start period of the negative acceleration and a corresponding high negative acceleration ~~negative acceleration at least one of a~~ third, ~~and a~~ higher than third, or both, derivative to time of the position of the motion at an end period of the negative acceleration, the absolute value of the corresponding high negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion being larger than the absolute value of the low negative acceleration ~~at least one of the~~ third, ~~and the~~ higher than third, or both, derivative to time of the position of the motion.

49. (Original) The computer program product of claim 43, wherein the acceleration comprises a positive acceleration phase and negative acceleration phase.

50. (Original) The computer program product of claim 43, wherein the acceleration comprises a scanning direction.

51. (Original) The computer program product of claim 43, wherein the acceleration comprises a stepping direction.

52. (Original) The computer program product of claim 43, wherein the motion signal comprises a position signal.